

SYSTEMATIC REASSESSMENT OF THE NORTH AMERICAN  
*PHYSALIS VISCOSA* COMPLEX (SOLANACEAE)

Billie L. Turner  
Plant Resources Center  
The University of Texas,  
Austin, TX 78712  
billie@uts.cc.utexas.edu

and

Mahinda Martinez, Escuela de Biología, Universidad Autónoma de  
Queretaro, Cerro de las Campanas s/n, Col. Centro, Queretaro,  
Queretaro, Mexico, mahinda@uaq.mx

ABSTRACT

The North American elements of *Physalis viscosa* are reassessed taxonomically. *Physalis cinerascens* var. *spathulifolia* (Torr.) J.R. Sullivan, a dune sand taxon of Gulf Coastal Texas and closely adjacent Mexico, is elevated to specific rank as ***Physalis spathulifolia*** (Torr.) B.L. Turner, **stat. nov.** Its closest morphological relationship appears to be with the similar Gulf Coastal dune species (*P. angustifolia* and *P. walteri*) of Louisiana, Mississippi, Alabama and Florida. *Physalis mollis* var. *variovestita* is treated as ***P. cinerascens*** var. ***variovestita*** (Waterfall) B.L. Turner, **comb. nov.**, since the latter is allopatric with var. *cinerascens* and the two grade one into the other. Distribution maps of the several taxa are provided, along with an abbreviated key to the taxa concerned. *Phytologia* 93(2): 260-269 (August 1, 2011)

RESUMEN

Se revisa la taxonomía de los elementos norteamericanos de *Physalis viscosa*. *Physalis cinerascens* var. *spatulifolia* (Torr.) J. R. Sullivan, una planta de las dunas arenosas de la costa del Golfo en Texas y Tamaulipas se eleva a nivel de especie como ***Physalis spathulifolia*** (Torr.) B. L. Turner, **stat. nov.** Morfológicamente, parece cercana a *P. angustifolia* y *P. walteri*, que se desarrollan en la costa del Golfo en dunas costeras de los estados de Louisiana, Mississippi, Alabama y Florida. *Physalis mollis* var. *variovestita* se transfiere como variedad de

*P. cinerascens*, proponiéndose la nueva combinación de *P. cinerascens* var. *variovestita* (Waterfall) B.L. Turner, **comb. nov.**, dado que es alopátrica con *P. cinerascens* var. *cinerascens* y las dos se intergradan. Se presentan mapas de distribución de los diferentes taxa, y se incluye una clave abreviada de los taxa tratados.

**KEY WORDS:** *Physalis*, *P. angustifolia*, *P. cinerascens*, *P. mollis*, *P. spathulifolia*, *P. viscosa*, *P. walteri*, Texas, dune sands

Sullivan (1985) provided a detailed systematic study of the *Physalis viscosa* complex in which five species were recognized, largely based upon biogeographical and experimental crossing data: 1. *P. viscosa* (confined to South America), 2. *P. angustifolia*, 3. *P. cinerascens* (with 2 varieties), 4. *P. mollis* (with 2 varieties) and 5. *P. walteri*. Both *P. cinerascens* and *P. mollis* occur in Texas and possess populations that occur along the Gulf Coastal region; coastal populations of the former, heretofore treated as a var. of *P. cinerascens*, are treated at specific rank; populations of the latter, heretofore treated at the specific level, or as a variety of *P. mollis*, are treated as a variety of the widespread, closely adjacent, *P. cinerascens*, with which it intergrades.

A review of the taxonomy of the group is presented below, along with justifications for the nomenclature provided. Distribution maps for all of the North American taxa of the *P. viscosa* complex are provided.

**Key to the North American taxa of the *P. viscosa* complex:**

1. Leaves glabrous or nearly so.....**P. angustifolia**
1. Leaves pubescent.....(2)
2. Under surfaces of mid-stem and upper leaves densely white-tomentose, the vestiture mostly obscuring the surface of blade.....**P. mollis**
2. Under surfaces of mid-stem and upper leaves mostly moderately to sparsely pubescent, the vestiture not usually obscuring the surface of the blades.....(3)

3. Anthers equal to or shorter than mature filaments.....**P. walteri**  
 3. Anthers 1.5 times as long as mature filaments, or longer.....(4)
4. Leaf margins to some extent undulate to dentate; corollas reflexed when fully opened; widespread, south-central USA to southern Mexico.....**P. cinerascens**  
 4. Leaf margins entire; corollas not reflexed when fully opened; coastal dune sands of Texas w Louisiana and n Mexico.....**P. spathulifolia**

**PHYSALIS ANGUSTIFOLIA** Nutt., J. Acad. Nat. Sci. Phila. 7: 113. 1834. **Fig. 1**

*Physalis viscosa* subsp. *maritima* var. *elliottii* (Kunze) Waterfall f. *glabra* Waterfall 1958

Sullivan (1985) cited a number of representative specimens, most of these shown in Fig. 1. He also noted that, "This species hybridizes with *P. walteri* in peninsular Florida, and populations can be found in this state that exhibit intermediate morphology," which seems to be the case.

**PHYSALIS CINERASCENS** (Dunal) Hitchc., Spring Fl. Manhattan 32: 1894. **Fig. 2**

*Physalis viscosa* var. *sinuadentata* Schlecht. 1846

*Physalis pensylvanica* var. *cinerascens* Dunal 1852

*Physalis curassavica* L. var. *sinuadentata* (Schlecht.) Dunal 1852

*Physalis mollis* var. *cinerascens* (Dunal) A. Gray 1875

*Physalis mollis* var. *parviflora* Rydb. 1896

*Physalis saltillensis* Fernald 1900

*Physalis viscosa* var. *cinerascens* (Dunal) Waterfall 1958

*Physalis viscosa* var. *yucatanensis* Waterfall 1967

This is a widespread, highly variable, interior species, occurring on various substrates, either calcareous or sandy. It is typified by material from northeastern, Tamaulipas, Mexico. Sullivan (1985) recognized two infraspecific taxa within the complex: var. *cinerascens* and var. *spathulifolia*. We have elevated the latter to specific rank in the present paper.

We do, however, recognize a weakly differentiated, var. *variovestita*, as follows:

/ **PHYSALIS CINERASCENS VAR. VARIOVESTITA**

(WATERFALL) B.L. Turner, **comb. nov. Fig. 3**

Based upon *Physalis variovestita* Waterfall, *Rhodora* 60: 137. 1958.

*Physalis mollis* var. *variovestita* (Waterfall) Sullivan 1985

Sullivan (1985) comments that *variovestita* is similar to *Physalis mollis* Nuttall in morphology and flavonoid chemistry, and the two produce fertile hybrids. However, *variovestita* is recognizable because of the combination of abundant glandular hairs that are short-dendritic and long articulated, and the dark, indistinct spots in the corolla throat.

Variety *variovestita* occurs on mostly interior deep sandy soils of southern Texas and intergrades with typical var. *cinerascens* near regions of contact (but not, in our opinion, with the more northeastern *P. mollis*). This is well attested to by annotations of Waterfall and Turner on specimens at LL-TEX. Indeed, the type of *variovestita* (from Rockport, Aransas Co, Texas) is somewhat intermediate between the two taxa [assuming typical populations of the glandular-pubescent populations are best represented in Brooks and Kenedy counties, as is our surmise]. Regardless, var. *variovestita* does not appear to grade into *P. mollis* as suggested by Sullivan's classification, although the occasional glandular hairs are found intermixed with forked hairs in many interior populations of both *P. mollis* and *P. cinerascens*, these presumably the result of interspecific hybridizations with yet other taxa, as well noted by Menzel (1960). Many such specimens were annotated by Waterfall as intergrades between *P. cinerascens* and *P. variovestita*.

**PHYSALIS MOLLIS** Nutt., *Trans. Amer. Philos. Soc.* 5(n.s.): 194. 1837. **Fig. 4**

*Physalis viscosa* subsp. *mollis* (Nutt.) Waterfall var. *mollis* Waterfall

This taxon is an interior species, usually confined to deep sandy soils of mostly forested areas in the regions shown in Fig. 2. It is partially sympatric with *P. cinerascens* and hybridization between the two taxa can be expected. Sullivan (1985) treated the taxon as having two infraspecific taxa: var. *variovestita* and var. *mollis*; on



biogeographical grounds, we treat the former as a variety of *P. cinerascens* in the present paper, while Waterfall treated it at the specific level.

**PHYSALIS SPATHULIFOLIA** (Torr.) B.L. Turner, *stat. nov.* **Fig. 5**  
Based upon *Physalis lanceolata* var. *spathulifolia* Torr. in Emory, Rep. U. S. and Mexican Bound. Surv. 2, part 1: 153. 1859.

*Physalis viscosa* var. *spathulifolia* (Torr.) A. Gray

*Physalis cinerascens* var. *spathulifolia* (Torr.) Sullivan

This taxon has all of the earmarks of a biological species since it is confined to a consistent habitat (dune sands along the Gulf Coast) and does not appear to intergrade with its presumed closest, largely allopatric relative, *P. cinerascens*.

All of the known collections of this taxon occur along the immediate Gulf Coast in dune sands, except for a single collection from Colorado Co., Texas (*Carr 19226*, TEX) which was reportedly obtained on the "W side of San Bernard River floodplain, ca 0.5 mi S to SSE of mouth of Coushatta Creek, where it occurs "on deep well drained coarse sand." The plant appears to be typical of the species and is perhaps introduced there from a coastal site.

**PHYSALIS WALTERI** Nutt., J. Acad. Nat. Sci. Phila. 7: 112. 1834.

**Fig. 6.**

*Physalis elliotii* Kunze 1847

*Physalis maritima* M.A. Curtis 1849

*Physalis viscosa* var. *maritima* (M.A. Curtis) Rydb. 1896

*Physalis viscosa* subsp. *maritima* (M.A. Curtis) Waterfall var. *maritima* f. *maritima* 1958

*Physalis viscosa* subsp. *maritima* (M.A. Curtis) Waterfall f. *latifolia* Waterfall

*Physalis viscosa* subsp. *maritima* (M.A. Curtis) Waterfall var. *elliotii* (Kunze) Waterfall f. *elliotii*

According to Sullivan (1985), this species hybridizes with *P. angustifolia* in peninsular Florida, and individuals can be found in this or that population that exhibit intermediate morphology such as broadly ovate, glabrous leaves, etc.

### ACKNOWLEDGEMENTS

Distribution maps are based upon specimens on file at LL-TEX, MEXU, and specimens cited by Sullivan in her published study, these supplemented with records reported by the USDA (when deemed appropriate).

### LITERATURE CITED

- Menzel, M.Y. 1960. What is *Physalis variovista*? Rhodora 62: 117-121.  
Sullivan, J.R. 1985. Systematics of the *Physalis viscosa* Complex (Solanaceae). Syst. Bot. 10: 426-444.  
Waterfall, U.T. 1958. A taxonomic study of the genus *Physalis* in North America north of Mexico. Rhodora 60: 107-114, 128-142.

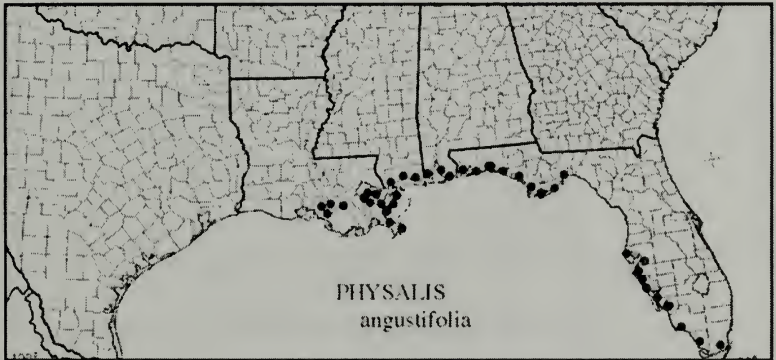


Fig. 1. Distribution of *P. angustifolia*.

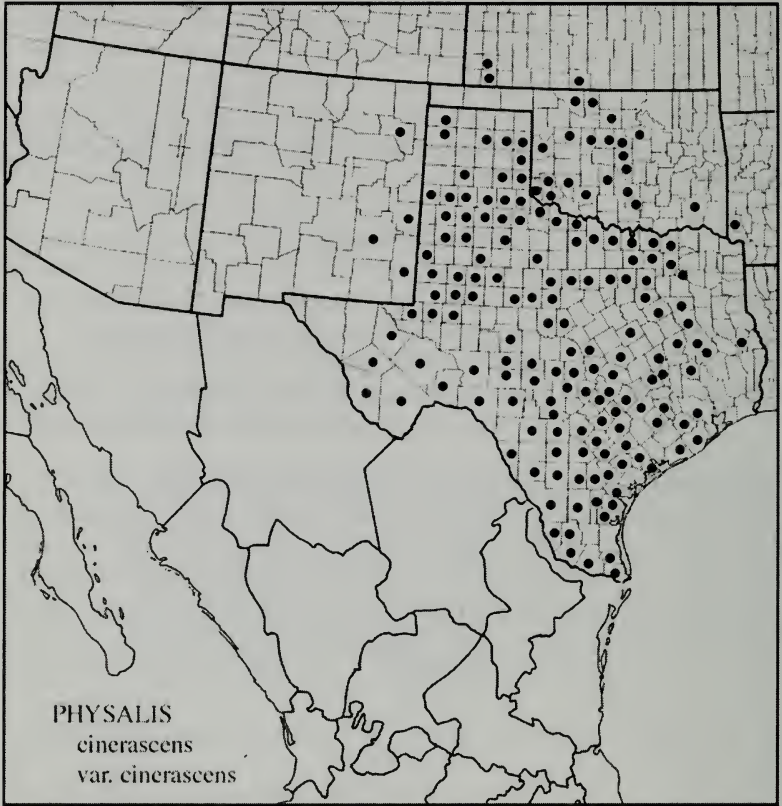


Fig. 2. Distribution of *P. cinerascens* var. *cinerascens*.

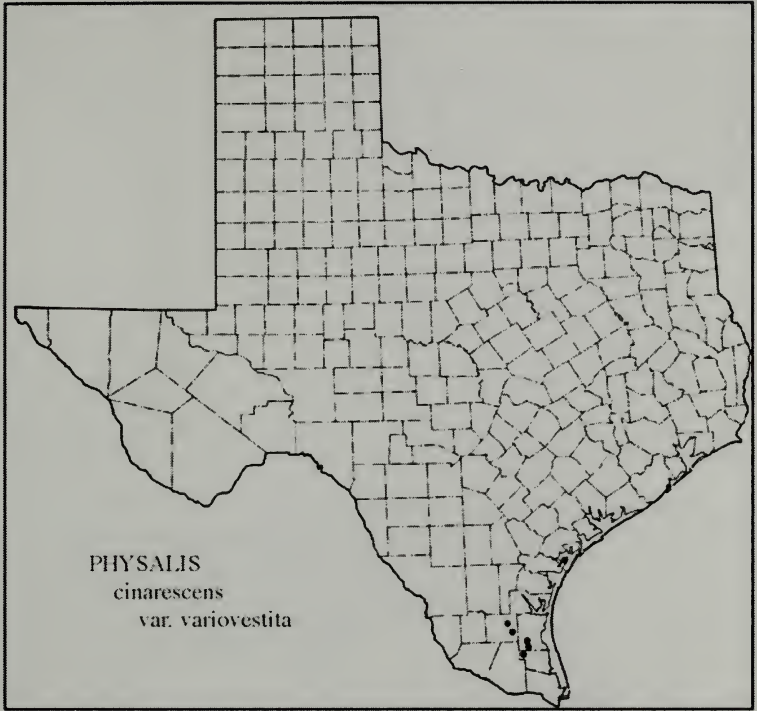


Fig. 3. Distribution of *P. cinerascens* var. *variovestita*.



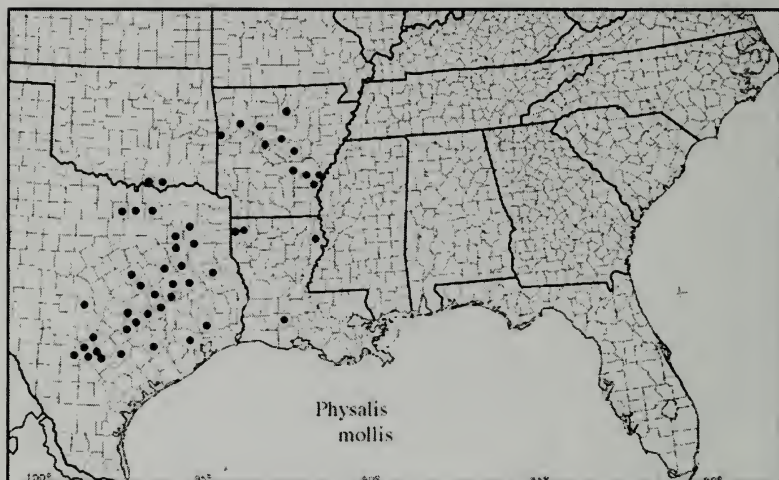


Fig. 4. Distribution of *Physalis mollis*.

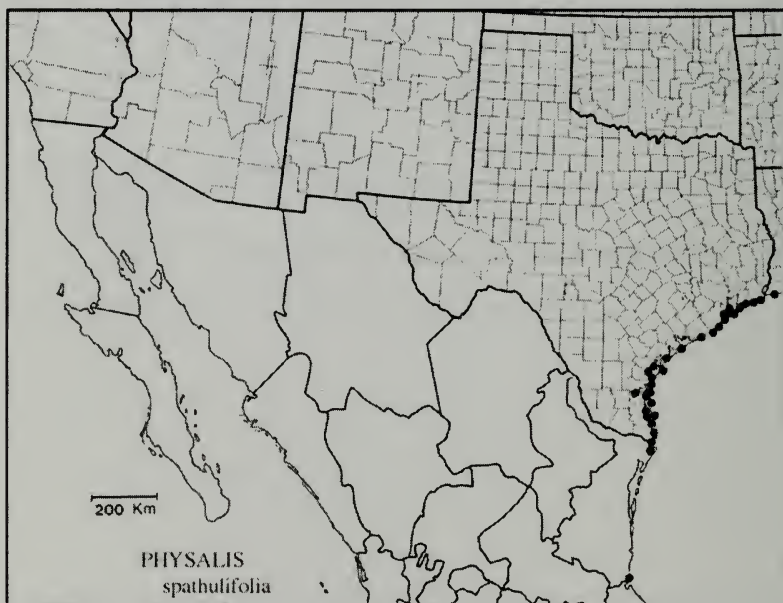


Fig. 5. Distribution of *P. spathulifolia*.

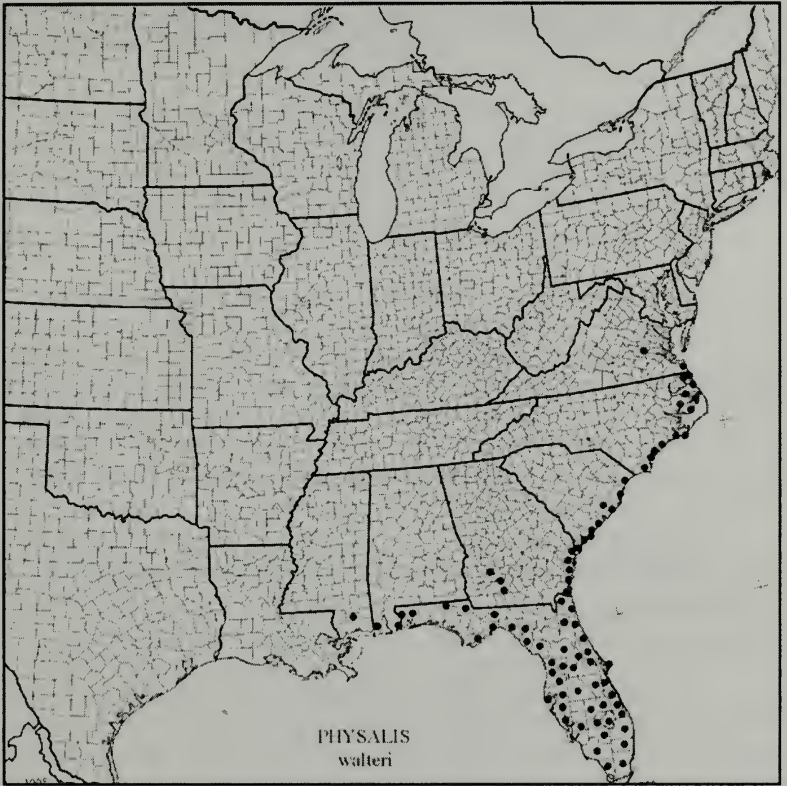


Fig. 6. Distribution of *P. walteri*.